

ABSTRACT

Independently deflectable control surfaces are located on the trailing edge of the wing of a blended wing-body aircraft. The reconfiguration control system of the present invention controls the deflection of each control surface to optimize the spanwise lift distribution across the wing for each of several flight conditions, e.g., cruise, pitch maneuver, and high lift at low speed. The control surfaces are deflected and reconfigured to their predetermined optimal positions when the aircraft is in each of the aforementioned flight conditions. With respect to cruise, the reconfiguration control system will maximize the lift to drag ratio and keep the aircraft trimmed at a stable angle of attack. In a pitch maneuver, the control surfaces are deflected to pitch the aircraft and increase lift. Moreover, this increased lift has its spanwise center of pressure shifted inboard relative to its location for cruise. This inboard shifting reduces the increased bending moment about the aircraft's x-axis occasioned by the increased pitch force acting normal to the wing. To optimize high lift at low speed, during take-off and landing for example, the control surfaces are reconfigured to increase the local maximum coefficient of lift at stall-critical spanwise locations while providing pitch trim with control surfaces that are not stall critical.